LETTERS TO THE EDITOR

Scope

Heart welcomes letters commenting on papers published in the journal in the previous six months. Topics not related to papers published earlier in the journal may be introduced as a letter: letters reporting original data may be sent for peer review.

Presentation

Letters should be:

- not more than 600 words and six references in length
- typed in double spacing (fax copies and paper copy only)
- signed by all authors

They may contain short tables or a small figure. **Please send a copy of your letter on disk.** Full instructions to authors appear in the July 1998 issue of *Heart* (page 104).

Ventricular pacemaker upgrade: experience, complications, and recommendations

SIR,—Hildick-Smith and colleagues[1] have reported high complication rates after pacemaker upgrade, with 45% of patients suffering one or more complications. We were initially surprised by this rate and were prompted to review the experience of surgically upgrading pacemakers at our hospital, which implants approximately 500 new pacing systems each year.

Between 1983 and December 1997, 74 patients' pacemakers were surgically upgraded from a single chamber (either AAI or VVI) to a dual chamber system. Forty five per cent of the upgrades were performed for pacemaker syndrome or worsening cardiac failure, 16% for atrioventricular (AV) block in patients with AAI pacemakers, 7% for carotid sinus hypersensitivity, 5% for miscellaneous reasons, and 27% were coincident with elective generator replacement. Nine per cent of these patients developed a wound or generator pocket infection requiring antibiotic treatment, 17% suffered a lead displacement or failure, and 15% required their upgrade pacemakers to be explanted (predominantly because of persistent infection or generator erosion). Therefore, 36% of patients suffered one or more complications, which is comparable to the 45% reported by Hildick-Smith *et al*.[1]

Our patients needing surgical reintervention were younger (58.5 (21.3) *v* 71.8 (12.9) years, p = 0.009) but otherwise had the same personal and operator characteristics, and pacemaker generator sizes as those without complications, albeit with a tendency to a lower body mass index. Infection was the predominant predictor of requiring further surgery (odds ratio 16.3, 95% confidence intervals 1.8 to 145.1). Complication rates for patients whose pacemakers were upgraded coincidentally with generator replacement were not significantly different from the remainder of the patient group.

These findings support the conclusion of Hildick-Smith *et al* that pacemaker upgrade should not be done in the absence of a firm indication. Atrial or dual chamber pacing should be the primary procedure wherever possible, as subsequent upgrade has a high morbidity. Recent prospective evidence strongly supports atrial based pacing in patients with sick sinus syndrome,[2–4] if not in those with AV block. We await the results of further trials in patients with AV block,[5] but it is clear that pacemaker upgrade should be avoided where possible, and certainly should not be performed opportunistically in the asymptomatic or uncomplaining patient. The onus is to select the correct pacing mode in the first instance.

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1 Hildick-Smith D, Lowe M, Newell SA, *et al*. Ventricular pacemaker upgrade: experience, complications, and recommendations. *Heart* 1998;**79**:383–7.
2 Lamas G, Orav E, Stambler B, *et al*. Quality of life and clinical outcomes in elderly patients treated with ventricular pacing as compared with dual chamber pacing. *N Engl J Med* 1998; **338**:1097–104.
3 Andersen HR, Thuesen L, Bagger JP, *et al*. Prospective randomised trial of atrial versus ventricular pacing in sick-sinus syndrome. *Lancet* 1994;**344**:1523–8.
4 Andersen HR, Nielson JC, Bloch Tomsen PE, *et al*. Long-term follow up of patients from a randomised trial of atrial versus ventricular pacing for sick sinus syndrome. *Lancet* 1997;**350**: 1210–16.
5 Lamas GA. Pacemaker mode selection and survival: a plea to apply the principles of evidence based medicine to cardiac pacing practice. *Heart* 1997;**78**:218–20.

Subpectoral implantation of a cardioverter defibrillator under local anaesthesia

SIR,—In a recent issue, Lipscomb and colleagues[1] reported on the implantation of cardioverter defibrillators (ICD) under sedation and local anaesthesia. In July 1997 we also began implantation of ICD devices under local anaesthesia, in conjunction with intravenous sedation using non-anaesthetic agents, in response to logistical problems in obtaining general anaesthetics coupled with the development of smaller devices. We have prospectively collected data on 34 consecutive implantations—28 men and six women (mean age 61, range 30–76) with mean left ventricular ejection fraction of 32% (range 15–70) of whom 29 had ischaemic heart disease. The presenting arrhythmia was ventricular fibrillation (VF) in seven, sustained ventricular tachycardia (VT) in 26, and non-sustained VT in one patient.

Like those of Lipscomb *et al* all procedures were performed in the catheter laboratory. Oxygen via nasal prongs was given routinely and monitored by pulse oximetry; two patients with poor left ventricular function were additionally monitored with arterial lines. Subcutaneous 1% lignocaine was administered in the usual fashion. However, our technique differs from that of Lipscomb *et al* in terms of the analgesia and sedation, lead insertion, and device testing, seemingly without detriment to the safety and acceptability of the procedure. Diazepam 5–15 mg (mean 9.2) was given at the start of the procedure with additional aliquots during subpectoral pouch formation and defibrillation threshold testing as required (mean 3.8 mg). Before fashioning the subpectoral pouch, intravenous pethidine 25 mg was given in all but one case, and an additional 25 mg was required in seven cases. Lipscomb *et al* comment on the importance of performing a subclavian puncture in the subpectoral tissue plane to avoid mechanical lead fracture; we have performed lead insertion in the more conventional fashion with elective cephalic vein cannulation if possible (23 patients) as with all of our previous implantations under general anaesthesia. Finally, to minimise discomfort to the patient we have avoided the use of low energy shocks to determine high voltage lead impedance before defibrillator threshold testing with no adverse consequences (mean impedance 57 ohms (range 43–72)), and for the same reasons we have aimed to induce VF with high frequency stimulation (31 cases) rather than T wave shocks (three cases).

Not withstanding these differences in technique, our experience confirms the previous findings of excellent safety and tolerability. No significant complications occurred periprocedurally or at follow up. Patients tolerated the procedures well and 18 were discharged home the following day (mean hospital stay 2.2 days, range 1–10). We believe that by implanting the defibrillators under local anaesthesia and intravenous sedation we have considerably improved efficiency of implantation and reduced hospital stay; patients no longer need to wait for general anaesthesia availability but can be scheduled during a routine cardiac laboratory list. We whole heartedly endorse the conclusions of Lipscomb *et al* that subpectoral ICD placement may be performed safely and tolerably under local anaesthesia and sedation in the cardiac catheter laboratory.

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1 Lipscomb KJ, Linker NJ, Fitzpatrick AP. Subpectoral implantation of a cardioverter defibrillator under local anaesthesia. *Heart* 1998;**79**:253–5.